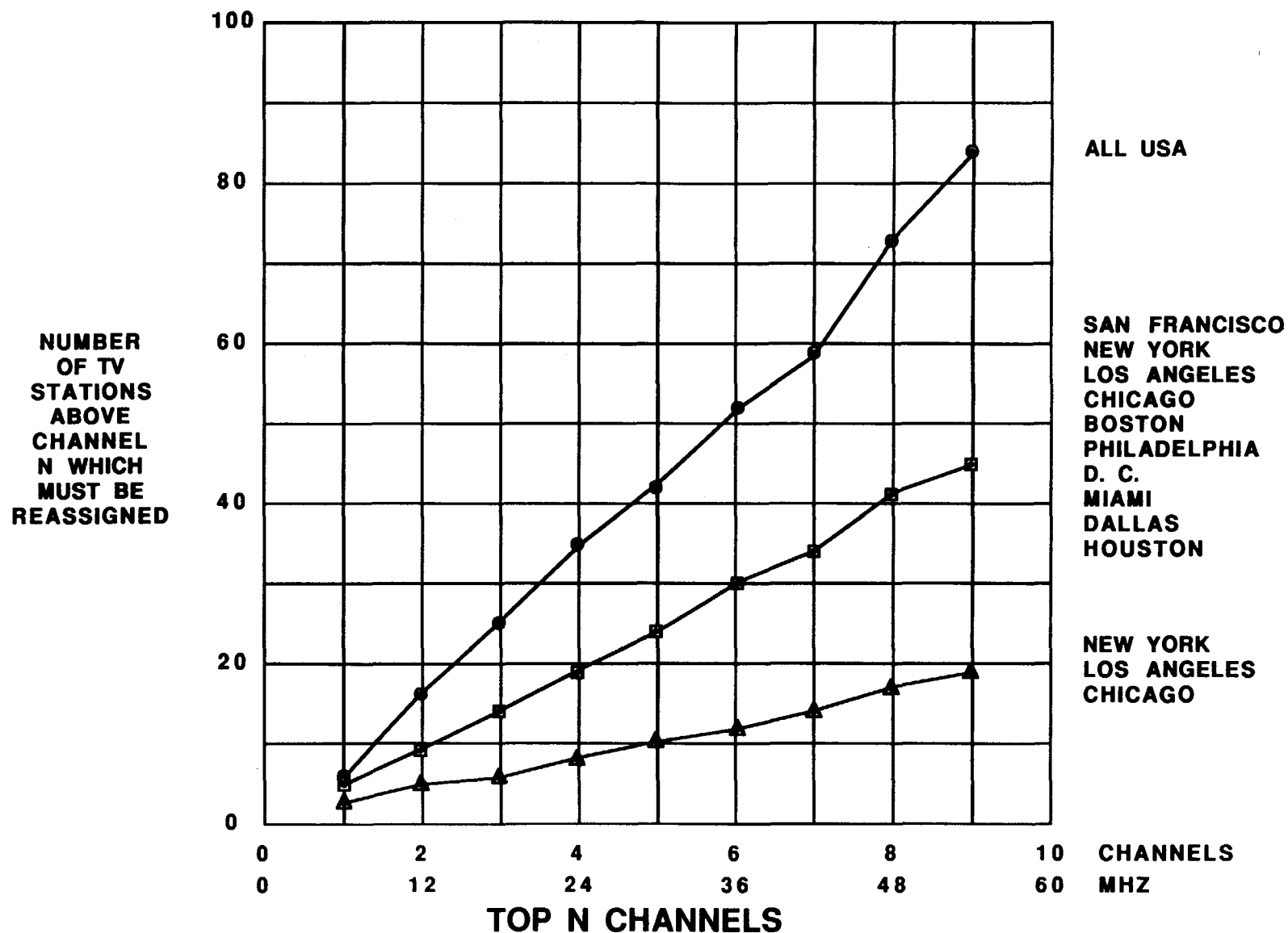


CALL*	CH	HDCH	TOWN	STATE	CALL*	CH	HDCH	TOWN	STATE
WBALTV	11	21	BALTIMORE	MD	WJZTV	13	23	BALTIMORE	MD
WHSW	24	27	BALTIMORE	MD	WBFF	45	29	BALTIMORE	MD
WNUVTV	54	31	BALTIMORE	MD	WMPB	61	26	BALTIMORE	MD
WIVQ	52	15	CUMBERLAND	MD	WLXV	28	22	CUMBERLAND	MD
WEPT	38	28	FREDERICK	MD	WHAGTV	25	16	HAGERSTOWN	MD
WWPB	31	21	HAGERSTOWN	MD	WJAL	34	02	HAGERSTOWN	MD
WGPT	36	09	OAKLAND	MD	WBOCTV	16	06	SALISBURY	MD
WCPB	28	02	SALISBURY	MD	WMDT	47	05	SALISBURY	MD
LM18	17	NONE	WASH (MD & VA	DC	LM19	18	NONE	WASH (MD & VA	DC
WRCTV	4	06	WASHINGTON	DC	WTTG	5	16	WASHINGTON	DC
WJLATV	7	10	WASHINGTON	DC	WUSA	9	12	WASHINGTON	DC
WDCATV	20	33	WASHINGTON	DC	WETATV	58	34	WASHINGTON	DC
WHMM	32	35	WASHINGTON	DC	WFTY	50	36	WASHINGTON	DC
WVVA	6	03	BLUEFIELD	WV	WCHSTV	8	10	CHARLESTON	WV
NU08	11	07	CHARLESTON	WV	WVAHTV	23	16	CHARLESTON	WV
WBOYTV	12	10	CLARKSBURG	WV	WLYJ	46	02	CLARKSBURG	WV
WSWPTV	9	12	GRANDVIEW	WV	WSAZTV	3	02	HUNTINGTON	WV
WOWKTV	13	06	HUNTINGTON	WV	WPBYTV	33	15	HUNTINGTON	WV
WNPBTv	24	23	MORGANTOWN	WV	WOAYTV	4	05	OAK HILL	WV
WTAPT	15	17	PARKERSBURG	WV	WDTV	5	04	WESTON	WV
WTRFTV	7	09	WHEELING	WV	NU09	14	08	ARLINGTON	VA
WZXX	42	14	ASHLAND	VA	WCYBTV	5	04	BRISTOL	VA
WVIRTV	29	04	CHARLOTTESVIL	VA	WHTJ	41	10	CHARLOTTESVIL	VA
WNVC	56	15	FAIRFAX	VA	WRBV	44	11	FREDERICKSBUR	VA
WNVT	53	39	GOLDVEIN	VA	WLFG	14	02	GRUNDY	VA
WVECTV	13	04	HAMPTON	VA	WHROTV	15	14	HAMPTON-NORFO	VA
WHSVTV	3	02	HARRISONBURG	VA	WSETTV	13	05	LYNCHBURG	VA
WJPR	21	02	LYNCHBURG	VA	WTKK	30	40	MANASSAS	VA
WMSYTV	52	07	MARION	VA	WTKC	55	16	NFLK-PTMTH-NW	VA
WTKRTV	3	02	NORFOLK	VA	WTVZ	33	19	NORFOLK	VA
WJCB	49	20	NORFOLK	VA	WSBNTV	47	03	NORTON	VA
WXEXTV	8	09	PETERSBURG	VA	WAVYTV	10	11	PORTSMOUTH	VA
WYAH	27	08	PORTSMOUTH	VA	WTVRTV	6	05	RICHMOND	VA
WWBT	12	07	RICHMOND	VA	WCVETV	23	15	RICHMOND	VA
WRLHTV	35	02	RICHMOND	VA	WCVW	57	16	RICHMOND	VA
WVRNTV	39	03	RICHMOND	VA	WDBJ	7	08	ROANOKE	VA
WSLSTV	10	11	ROANOKE	VA	WBRATV	15	14	ROANOKE	VA
WVFT	27	16	ROANOKE	VA	WEFC	38	19	ROANOKE	VA
WZZW	60	04	ROANOKE	VA	WVPT	51	06	STAUNTON	VA
WVBT	43	21	VIRGINIA BEAC	VA					

* Some stations had no call letters in the FCC data base, they were called "NEW". In this data base they are called NU## with unique numbers assigned each for purposes of identification. Similarly, the land mobile allocations are called LM##.

FIGURE A2 - 1

**Number of existing TV stations in the top N channels in the USA.
When specific cities are indicated, the number of those stations
within 155 miles of the cities is indicated**



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APPENDIX 3

INTRODUCTION

It is the purpose of this appendix to show that the existing UHF TV stations can be repacked into fewer channels, permitting more spectrum efficient use of the UHF TV spectrum. The effect of taboos on repacking will be discussed. Thus, an Advanced Television system such as the NBC/RCA/Sarnoff labs ACTV-1 could be implemented and have additional spectrum left over, for other uses.

The area which is most dense, the northeast corridor will be used to demonstrate that significant improvements in spectrum utilization can be made if the only criteria for channel allocation is the co-channel and first adjacent channel spacing.

BACKGROUND

The most dense area in the USA has 48 TV stations within the co-channel re-use distance. This area is centered near Baltimore, MD, and the stations within this area and relevant parameters are shown in Table A3-1. There are a total of 67 channels in the TV spectrum (channels 2-13 VHF and channels 14-36 and 38-69 UHF with channel 37 reserved for radio astronomy). The UHF taboos presently limit the way the TV stations are assigned their channel. If these taboos were eliminated, it might be possible that all of the existing TV stations in the USA could be repacked into channels in the upper 48 leaving the lower 67-48=19 channels, or 114 MHz, for use by other services. Certainly, in some regions of the US this would be possible. However, as shown later in this appendix, other practical limitations reduce the spectrum which can be made available when all locations are considered.

There are several parties that have suggested that the taboos could be eliminated with little adverse impact on the viewing public. The major impact would be on the UHF broadcasters who would need new transmitters, antennas, and in some cases transmission lines when their channel is changed. The VHF broadcasters channel would not be impacted by this proposal.

ANALYSIS

In order to investigate this option further, the UHF TV stations in the data base described in Appendix 1 were repacked. A computer algorithm was used which identified those channels 14-69, which were available for the station under consideration, and then the assignments were made from the top down either manually or in an automatic mode. The existing minimum co-channel spacing requirement of 155 miles and adjacent channel spacing of 55 miles were used in the program. For purposes of this analysis, no land mobile allocations were included and there was no effort to retain a station on its present channel.

When the stations within the co-channel re-use diameter in Table A3-1 were assigned the upper 48 channels, those outside of that diameter required channels lower than that. There is only one station, WMHT in Schenectady, NY assigned channel 30, and another one, WHCT in Hartford, CT which is assigned channel 31. The median co-channel minimum spacing between the rest of the stations is 174 miles.

Thus, all of the UHF TV stations were repacked into channels 30-69. The station and their assignments are shown in Table A3-2. The channels shown are one set which meet the co-channel and adjacent channel spacings. Numerous options exist for each assignment which meet the spacing requirement and permit repacking into channels 30-69. The bottom 16 channels, or 96 MHz could therefore be made available in this manner. Since this represents the most dense area in USA, it is concluded that such repacking could probably take place over the entire USA. Again, the effect of limitations on stations near the Canadian border was not a part of this study, and further effort is required to quantify that effect.

TABLE A3-1

TELEVISION STATIONS WITHIN THE CO-CHANNEL
RE-USE DISTANCE NEAR BALTIMORE, MD

FROM CENTER OF REGION
AZIMUTH

CH	CALL	LOCATION		POWER, KW	HT IN FT	DIST, MI	DIRECTION
39	WLVT TV	ALLENTOWN	PA	575.0	990.8	77.3	26.1
69	WFMZ TV	ALLENTOWN	PA	219.0	899.0	77.1	25.9
60	NU05	BETHLEHEM	PA	5000.0	1482.9	77.4	26.1
21	WHPTV	HARRISBURG	PA	1200.0	1220.5	68.2	322.7
27	WHTMTV	HARRISBURG	PA	2400.0	1118.8	69.4	318.8
33	WITFTV	HARRISBURG	PA	1100.0	1400.9	68.2	322.7
8	WGALT V	LANCASTER	PA	112.0	1361.5	43.2	319.1
15	WLYHTV	LANCASTER	PA	1050.0	1361.5	52.4	337.4
55	WGGF	LEBANON	PA	1200.0	1460.0	68.2	323.1
3	KYWT V	PHILADELPHIA	PA	100.0	1000.7	55.7	53.1
6	WPVITV	PHILADELPHIA	PA	74.1	1089.2	55.7	53.1
10	WCAUTV	PHILADELPHIA	PA	191.0	1161.4	55.9	53.3
17	WPHLTV	PHILADELPHIA	PA	2340.0	1049.9	55.7	53.2
29	WTAFTV	PHILADELPHIA	PA	5000.0	1138.5	55.7	53.3
35	WYBE	PHILADELPHIA	PA	324.0	557.7	59.8	52.8
57	WGBSTV	PHILADELPHIA	PA	5000.0	1158.1	55.7	53.5
51	WTVE	READING	PA	1450.0	751.3	55.5	10.1
49	WGCBTV	RED LION	PA	617.0	580.7	35.6	311.9
43	WPMT	YORK	PA	2140.0	1361.5	42.2	319.7
48	NU06	BURLINGTON	NJ	2340.0	1099.1	55.6	53.1
23	WNJS	CAMDEN	NJ	2340.0	889.1	66.9	79.8
59	WLMR	VINELAND	NJ	5000.0	941.6	55.3	98.1
65	WHSP	VINELAND	NJ	3800.0	918.6	67.1	79.4
40	WMGMTV	WILDWOOD	NJ	741.0	419.9	76.6	112.8
64	WDPB	SEAFORD	DE	186.0	639.8	67.6	157.9
12	WHYYTV	WILMINGTON	DE	309.0	961.3	55.7	53.2
61	WTGITV	WILMINGTON	DE	3020.0	958.0	42.7	77.4
22	WMPT	ANNAPOLIS	MD	5000.0	869.4	47.4	216.5
2	WMARTV	BALTIMORE	MD	100.0	1000.7	34.1	242.7
11	WBALTV	BALTIMORE	MD	316.0	1000.7	34.1	242.7
13	WJZTV	BALTIMORE	MD	316.0	990.8	34.1	242.7
24	WHSW	BALTIMORE	MD	1170.0	1069.6	40.8	242.5
45	WBFF	BALTIMORE	MD	1580.0	1056.4	34.0	242.8
54	WNUVTV	BALTIMORE	MD	4680.0	1151.6	40.8	242.5
67	WMPB	BALTIMORE	MD	1000.0	820.2	37.8	258.4
62	WFPT	FREDERICK	MD	25.1	1161.4	75.5	266.9
16	WBOCTV	SALISBURY	MD	4070.0	981.0	76.8	161.9
47	WMDT	SALISBURY	MD	3470.0	1000.7	75.6	165.6
4	WRCTV	WASHINGTON	DC	100.0	570.9	68.5	231.5
5	WTTG	WASHINGTON	DC	100.0	771.0	67.9	232.2
7	WJLATV	WASHINGTON	DC	316.0	771.0	68.0	231.9
9	WUSA	WASHINGTON	DC	316.0	771.0	68.0	231.9
20	WDCATV	WASHINGTON	DC	3980.0	771.0	68.5	233.2
26	WETATV	WASHINGTON	DC	1620.0	771.0	68.5	233.2
32	WHMM	WASHINGTON	DC	5000.0	698.8	68.5	233.2
50	WFTY	WASHINGTON	DC	5000.0	820.2	65.3	230.9
14	NU09	ARLINGTON	VA	2750.0	426.5	69.2	231.6
6	WNVC	FAIRFAX	VA	1230.0	731.6	77.3	232.4

CENTER OF REGION:

LATITUDE 39° 33' 45" LONGITUDE 76° 5' 0"

12 VHF STATIONS WITHIN 85.0 MILES OF ABOVE

36 UHF STATIONS WITHIN 77.5 MILES OF ABOVE

TOTAL 48 STATIONS

FIGURE A3-2

REPACKED UHF TV STATIONS ON THE NORTHEAST CORRIDOR.
 MINIMUM CO-CHANNEL SPACING IS 155 MILES, MINIMUM ADJACENT
 CHANNEL SPACING IS 55 MILES. ALL CHANNELS REPACKED INTO
 CHANNELS 30 THROUGH 69.

<u>CALL*</u>	<u>CH</u>	<u>NEW CHAN.</u>	<u>TOWN</u>	<u>STATE</u>	<u>CALL*</u>	<u>CH</u>	<u>NEW CHAN.</u>	<u>TOWN</u>	<u>STATE</u>
WMEATV	26	65	BIDDEFORD	ME	NU01	35	69	LEWISTON	ME
WPXT	51	67	PORTLAND	ME	NU02	62	69	PRESQUE ISLE	ME
WVNY	22	64	BURLINGTON	VT	WETK	33	60	BURLINGTON	VT
WNNETV	31	48	HARTFORD	VT	WVER	28	57	RUTLAND	VT
WVTB	20	66	ST. JOHNSBURY	VT	WVTA	41	59	WINDSOR	VT
WEDBTB	40	62	BERLIN	NH	WNHT	21	63	CONCORD	NH
WNDS	50	41	DERRY	NH	WHEDTV	15	55	HANOVER	NH
WEKWTB	52	61	KEENE	NH	WLEDTV	49	51	LITTLETON	NH
WGOT	60	68	MERRIMACK	NH	WCDC	19	54	ADAMS	MA
WFXT	25	36	BOSTON	MA	WSBKTV	38	49	BOSTON	MA
WGBXTV	44	45	BOSTON	MA	WQTV	68	64	BOSTON	MA
WLVTB	56	39	CAMBRIDGE	MA	WLQF	32	43	GREENFIELD	MA
WMFP	62	53	LAWRENCE	MA	WHSB	66	58	MARLBOROUGH	MA
WFDG	28	62	NEW BEDFORD	MA	WRYT	46	56	NORWELL	MA
WVUW	51	66	PITTSFIELD	MA	WWLP	22	69	SPRINGFIELD	MA
WGBTB	40	50	SPRINGFIELD	MA	WGBYTV	57	52	SPRINGFIELD	MA
WCVX	58	66	VINEYARD HAVE	MA	WHLL	27	47	WORCESTER	MA
WBCTTV	43	63	BRIDGEPORT	CT	WEDW	49	48	BRIDGEPORT	CT
WHCTTV	18	31	HARTFORD	CT	WEDH	24	38	HARTFORD	CT
WTICTV	61	33	HARTFORD	CT	WVIT	30	35	NEW BRITAIN	CT
WTVU	59	67	NEW HAVEN	CT	WEDY	65	60	NEW HAVEN	CT
WTWS	26	57	NEW LONDON	CT	WEDN	53	46	NORWICH	CT
WTXX	20	55	WATERBURY	CT	WOSTTV	69	42	BLOCK ISLAND	RI
WSBETV	36	32	PROVIDENCE	RI	WNACTV	64	34	PROVIDENCE	RI
WXKATV	23	62	ALBANY	NY	WOCB	55	56	AMSTERDAM	NY
WMGCTV	34	68	BINGHAMTON	NY	WICZTV	40	55	BINGHAMTON	NY
WSKGTB	46	51	BINGHAMTON	NY	WNEDTV	17	69	BUFFALO	NY
WNEQTV	23	68	BUFFALO	NY	WUTV	29	66	BUFFALO	NY
WNYBTB	49	64	BUFFALO	NY	WETMTB	18	49	ELMIRA	NY
WENYTV	36	47	ELMIRA	NY	WLIW	21	56	GARDEN CITY	NY
NU03	52	45	ITHACA	NY	WNOD	26	67	JAMESTOWN	NY
WTZA	62	64	KINGSTON	NY	WNYETB	25	36	NEW YORK	NY
WNYCTB	31	45	NEW YORK	NY	WNPITB	18	69	NORWOOD	NY
WCFETB	57	58	PLATTSBURGH	NY	WTBY	54	53	POUGHKEEPSIE	NY
WLBG	55	51	RIVERHEAD	NY	WXXITB	21	62	ROCHESTER	NY
WUHF	31	61	ROCHESTER	NY	WMHT	17	30	SCHENECTADY	NY
WMHX	45	40	SCHENECTADY	NY	WHSI	67	44	SMITHTOWN	NY
WCNYTV	24	63	SYRACUSE	NY	WSNRTB	43	58	SYRACUSE	NY
NU04	56	52	SYRACUSE	NY	WSYT	68	50	SYRACUSE	NY
WUTR	20	67	UTICA	NY	WTUV	33	60	UTICA	NY
WNPETB	16	66	WATERTOWN	NY	WFXFTB	50	59	WATERTOWN	NY
WLVTB	39	50	ALLENTOWN	PA	WFMZTV	69	69	ALLENTOWN	PA
WWPCTB	23	69	ALTOONA	PA	WKBSTB	47	55	ALTOONA	PA
NU05	60	52	BETHLEHEM	PA	WJETTV	24	63	ERIE	PA
WSEE	35	60	ERIE	PA	WQLN	54	58	ERIE	PA

<u>CALL*</u>	<u>CH</u>	<u>NEW CHAN.</u>	<u>TOWN</u>	<u>STATE</u>	<u>CALL*</u>	<u>CH</u>	<u>NEW CHAN.</u>	<u>TOWN</u>	<u>STATE</u>
WETG	66	57	ERIE	PA	WPCBT	40	62	GREENSBURG	PA
WHPTV	21	48	HARRISBURG	PA	WHTMTV	27	58	HARRISBURG	PA
WITFTV	33	63	HARRISBURG	PA	WWLF	56	44	HAZLETON	PA
WFATTV	19	65	JOHNSTOWN	PA	WLYHTV	15	56	LANCASTER	PA
WGGF	55	60	LEBANON	PA	WPHLTV	17	40	PHILADELPHIA	PA
WTAFTV	29	38	PHILADELPHIA	PA	WYBE	35	46	PHILADELPHIA	PA
WGBSTV	57	33	PHILADELPHIA	PA	WQEX	16	54	PITTSBURGH	PA
WPTTTV	22	52	PITTSBURGH	PA	WPGHTV	53	50	PITTSBURGH	PA
WTVE	51	67	READING	PA	WGCBT	49	54	RED LION	PA
WNEPTV	16	57	SCRANTON	PA	WYOU	22	59	SCRANTON	PA
WOLFTV	38	65	SCRANTON	PA	WVIATV	44	61	SCRANTON	PA
WXEK	29	46	STATE COLLEGE	PA	WBRETV	28	32	WILKES-BARRE	PA
WPMT	43	42	YORK	PA	WWACTV	53	64	ATLANTIC CITY	NJ
NU06	48	35	BURLINGTON	NJ	WNJS	23	68	CAMDEN	NJ
WNJUTV	47	49	LINDEN	NJ	WNJM	50	47	MONTCLAIR	NJ
WNJB	58	43	NEW BRUNSWICK	NJ	WHSE	68	34	NEWARK	NJ
WXTV	41	39	PATERSON	NJ	WNJT	52	62	TRENTON	NJ
WLMR	59	53	VINELAND	NJ	WHSP	65	66	VINELAND	NJ
NU07	66	41	WEST MILFORD	NJ	WMGMTV	40	51	WILDWOOD	NJ
WDPB	64	61	SEAFORD	DE	WTGITV	61	55	WILMINGTON	DE
WMPT	22	65	ANNAPOLIS	MD	WHSW	24	39	BALTIMORE	MD
WBFF	45	45	BALTIMORE	MD	WNUVT	54	36	BALTIMORE	MD
WMPB	67	49	BALTIMORE	MD	WIVQ	52	61	CUMBERLAND	MD
WLXV	65	59	CUMBERLAND	MD	WFPT	62	64	FREDERICK	MD
WHAGTV	25	68	HAGERSTOWN	MD	WWPB	31	66	HAGERSTOWN	MD
WJAL	68	53	HAGERSTOWN	MD	WGPT	36	67	OAKLAND	MD
WBOCTV	16	59	SALISBURY	MD	WCPB	28	44	SALISBURY	MD
WMDT	47	57	SALISBURY	MD	WDCATV	20	41	WASHINGTON	DC
WETATV	26	34	WASHINGTON	DC	WHMM	32	32	WASHINGTON	DC
WFTY	50	43	WASHINGTON	DC	WVAHTV	23	69	CHARLESTON	WV
WLYJ	46	58	CLARKSBURG	WV	WPBYTV	33	67	HUNTINGTON	WV
WNPBT	24	56	MORGANTOWN	WV	WTAPT	15	68	PARKERSBURG	WV
NU09	14	47	ARLINGTON	VA	WZXX	65	51	ASHLAND	VA
WVIRT	29	63	CHARLOTTESVIL	VA	WHTJ	41	60	CHARLOTTESVIL	VA
WNVC	56	62	FAIRFAX	VA	WRBV	69	69	FREDERICKSBUR	VA
WNVT	53	50	GOLDVEIN	VA	WLFG	68	68	GRUNDY	VA
WHROTV	15	68	HAMPTON-NORFO	VA	WJPR	21	66	LYNCHBURG	VA
WTKK	66	52	MANASSAS	VA	WMSYTV	52	65	MARION	VA
WTKC	55	66	NFLK-PTMTH-NW	VA	WTVZ	33	64	NORFOLK	VA
WJCB	49	55	NORFOLK	VA	WSBNTV	47	66	NORTON	VA
WYAH	27	53	PORTSMOUTH	VA	WCVETV	23	67	RICHMOND	VA
WRLHTV	35	58	RICHMOND	VA	WCVW	57	56	RICHMOND	VA
WVRNTV	63	54	RICHMOND	VA	WBRATV	15	64	ROANOKE	VA
WVFT	27	59	ROANOKE	VA	WEFC	38	55	ROANOKE	VA
WZZW	60	62	ROANOKE	VA	WVPT	51	57	STAUNTON	VA
WVBT	43	49	VIRGINIA BEAC	VA					

* Some stations had no call letters in the FCC data base, they were called "NEW". In this data base they are called NU## with unique numbers assigned each for purposes of identification.